PHOSPHORUS OXYCHLORIDE

PPO

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Phosphoryl chloride	Oily liquid Colorless to light yellow Musty odor Fumes in air, sinks and reacts with water. Poisonous gas is produced. Freezing point is 34°F.

Evacuate.
Keep people away. Avoid contact with liquid and vapor.
Wear chemical protective suit with self-contained breathing apparatus.
Notify local health and pollution control agencies.
Protect water intakes.

Fire	Not flammable. Wear chemical protective suit with self-contained breathing apparatus. DO NOT USE WATER ON ADJACENT FIRES.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose, and throat. Harmful if inhaled. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn skin and eyes. Harmful if swallowed. Remove to fresh air. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse dissolved material
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $POCl_3$
2.3 IMO/UN Designation: 8.0/1810
2.4 DOT ID No.: 1810
2.5 CAS Registry No.: 10025-87-3
2.6 NAERG Guide No.: 137
2.7 Standard Industrial Trade Classification: 52241

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Chemical safety goggles; face shield; self-contained or air-line respirator; hard hat; foot protection; rubber gloves and clothing.
3.2 Symptoms Following Exposure: Vapors burn eyes and respiratory tract. Liquid is very corrosive to body tissues because of reaction with water to form hydrochloric and phosphoric acids.
3.3 Treatment of Exposure: CAUTION: persons doing treatments should protect themselves against exposure. INHALATION: remove victim from contaminated area at once; if breathing has stopped, start artificial respiration; call a doctor. INGESTION: give water or milk; do NOT induce vomiting. SKIN: remove contaminated clothing and flood exposed skin surfaces with water. EYES: retract eyelids and wash with water for at least 15 min.; call a doctor.
3.4 TLV-TWA: 0.1 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 3; oral rat LD_{50} = 380 mg/kg
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.
3.11 Liquid or Solid Characteristics: Severe skin irritant. Causes second-and third-degree burns on short contact and is very injurious to the eyes.
3.12 Odor Threshold: Currently not available
3.13 IDLH Value: Not listed.
3.14 OSHA PEL-TWA: Not listed.
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: Not flammable
4.2 Flammable Limits in Air: Not flammable
4.3 Fire Extinguishing Agents: Sand and carbon dioxide on adjacent fires
4.4 Fire Extinguishing Agents Not to Be Used: Water
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Poisonous, corrosive, irritating gases are generated when heated or when in contact with water.
4.7 Auto Ignition Temperature: Not flammable
4.8 Electrical Hazards: Not pertinent
4.9 Burning Rate: Not flammable
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: Not pertinent.
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): Not pertinent.
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Vigorous reaction with evolution of hydrogen chloride fumes.
5.2 Reactivity with Common Materials: Corrosive to most metals except nickel and lead. Products of its reaction with water rapidly corrode steel and most metals with formation of flammable hydrogen gas.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Flush with water, neutralize acids formed with lime or soda ash.
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): None
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: (1)
Human Oral hazard: 2
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99-99.9%
7.2 Storage Temperature: Above 35°F
7.3 Inert Atmosphere: No requirement
7.4 Venting: Pressure-vacuum
7.5 IMO Pollution Category: Currently not available
7.6 Ship Type: Currently not available
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Corrosive material
8.2 49 CFR Class: 8
8.3 49 CFR Package Group: II
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	4
Flammability (Red).....	0
Instability (Yellow).....	2
Special (White).....	~~W~~

8.6 EPA Reportable Quantity: Not listed.
8.7 EPA Pollution Category: Not listed.
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 153.33
9.3 Boiling Point at 1 atm: 225°F = 107°C = 380°K
9.4 Freezing Point: 34°F = 1°C = 274°K
9.5 Critical Temperature: 629.6°F = 332°C = 605.2°K
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.675 at 20°C (liquid)
9.8 Liquid Surface Tension: Not pertinent
9.9 Liquid Water Interfacial Tension: Not pertinent
9.10 Vapor (Gas) Specific Gravity: Not pertinent
9.11 Ratio of Specific Heats of Vapor (Gas): (est.) 1.290
9.12 Latent Heat of Vaporization: 97 Btu/lb = 54 cal/g = 2.3 X 10^5 J/kg
9.13 Heat of Combustion: Not pertinent
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
35	106.700	85	0.235		N		N
40	106.400	90	0.235		O		O
45	106.099	95	0.235		T		T
50	105.700	100	0.235				
55	105.400	105	0.235		P		P
60	105.099	110	0.235		E		E
65	104.799	115	0.235		R		R
70	104.500	120	0.235		T		T
75	104.200	125	0.235		I		I
80	103.900	130	0.235		N		N
85	103.599	135	0.235		E		E
90	103.200	140	0.235		N		N
95	102.900	145	0.235		T		T
100	102.599	150	0.235				
105	102.299						
110	102.000						
115	101.700						
120	101.400						
125	101.099						
130	100.799						
135	100.400						
140	100.099						

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	D	40	0.226	40	0.00646	90	0.058
	E	50	0.311	50	0.00873	100	0.058
	C	60	0.423	60	0.01163	110	0.058
	O	70	0.567	70	0.01529	120	0.058
	M	80	0.750	80	0.01986	130	0.058
	P	90	0.982	90	0.02551	140	0.058
	O	100	1.270	100	0.03242	150	0.058
	S	110	1.626	110	0.04078	160	0.058
	E	120	2.062	120	0.05081	170	0.058
	S	130	2.590	130	0.06275	180	0.058
		140	3.226	140	0.07685	190	0.058
		150	3.986	150	0.09338	200	0.058
		160	4.886	160	0.11260	210	0.058
		170	5.945	170	0.13490	220	0.058
		180	7.185	180	0.16040	230	0.058
		190	8.625	190	0.18960	240	0.058
		200	10.290	200	0.22280	250	0.058
		210	12.210	210	0.26030	260	0.058
		220	14.390	220	0.30250		